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AUTHOR: Vasyl'yev, V.I. (Kiev)

TITLE: Investigation of steady-state and dynamic regimes of differential extremal systems

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TEXT: The author analyses theoretically the performance of two differential extremal system circuits, one utilizing the principle of deformation of the extremum characteristic and the other in which the object to be controlled is represented by an analog having a linear component with inertia and a nonlinear inertialess element. The analysis shows that both systems operate without hunting oscillations, the first of the two systems being absolutely immune with respect to disturbances which shift the extremal characteristic of the controlled object along the vertical axis. The first system should be used with objects with small disturbances. Since in the most general case it maintains the object away from the extremum, it is inaccurate. The system with analogs is shown to be the most

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accurate. It can be used in all cases when an analog of the controlled object can be realized. Both systems are shown to be affected by changes in the gain of amplifiers. When the gain of amplifiers is not stable, the error will depend also on the changes in the slope of characteristics. Both systems are stated to be valid for any shape of the extremum characteristic. The author analyzes their operation in the presence of both linearly varying and stepped disturbances. The second system was applied successfully to the control of chemical purification of water of the Mins'kaya TEC-2 (TYeTs-2). There are 5 figures.

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